

1. An apparatus for stabilizing a photonic signal, the apparatus comprising:
 - a photonic source configured to receive a modulated photonic signal and to provide a photonic output signal corresponding thereto;
 - a seed source configured to provide a photonic seed signal having a selected wavelength
 - 5 within an operable bandwidth of the photonic source;
 - a combiner operably connected to receive the photonic output signal;
 - the combiner, further configured to direct a portion of the energy of the photonic seed signal into the photonic source; and
 - the combiner, further configured to output the energy of the photonic output signal, stabilized to the selected wavelength.
2. The apparatus of claim 1, wherein the photonic seed source is further configured to be modulated and to provide the modulated signal to the photonic source.
3. The apparatus of claim 1, wherein the photonic source is a switched source of laser light.
4. The apparatus of claim 1, wherein the photonic seed source provides a photonic seed signal having an energy below a threshold level corresponding to the photonic source.
- 20 5. The apparatus of claim 4, further comprising a modulator operably connected to the photonic source for providing the modulated signal.

6. The apparatus of claim 5, wherein the modulator is configured to modulate a parameter selected from amplitude, switching on and off, pulse width, state of polarization, phase, and frequency.

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7. The apparatus of claim 5, further comprising a selector connected to receive synchronization information from the modulator, to receive a frequency selection input, and to output to the photonic seed source a control signal for controlling the frequency and phase of the photonic seed reference.

8. The apparatus of claim 7, wherein the frequency selection input is configured to establish a value of a parameter selected from the group consisting of frequency, phase, amplitude, duration, and a combination of at least two thereof.

9. The apparatus of claim 1, wherein the combiner is selected from the group consisting of a beam splitter, a grating, and a hologram.

10. The apparatus of claim 9, wherein the beam splitter is selected from an amplitude beam splitter, a wave-front beam splitter, a polarization beam splitter, a frequency beam splitter, a phase beam splitter, a combination of two or more thereof, and a holographic beam splitter.

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11. The apparatus of claim 1, wherein the photonic seed source is operably connected to the photonic source to provide the modulated signal thereto.

12. The apparatus of claim 11, wherein the photonic source is a laser.

13. The apparatus of claim 12, wherein the laser is a switched source of laser light.

5 14. The apparatus of claim 11, wherein the photonic seed source provides a photonic seed signal having an energy below a threshold level corresponding to the photonic source.

15. The apparatus of claim 14, further comprising a modulator operably connected to the photonic source for providing the modulated signal.

16. The apparatus of claim 15, wherein the modulator is configured to modulate a parameter selected from amplitude, switching on and off, pulse width, state of polarization, phase, and frequency.

17. The apparatus of claim 16, further comprising a selector connected to receive synchronization information from the modulator, to receive a frequency selection input, and to output to the photonic seed source a control signal for controlling the frequency and phase of the photonic seed reference.

20 18. The apparatus of claim 17, wherein the frequency selection input is configured to establish a value of a parameter selected from the group consisting of frequency, phase, amplitude, duration, and a combination of at least two thereof.

19. The apparatus of claim 18, wherein the combiner is selected from the group consisting of a beam splitter, a grating, and a hologram.

20. The apparatus of claim 19, wherein the beam splitter is selected from an amplitude beam
5 splitter, a wave-front beam splitter, a polarization beam splitter, a frequency beam splitter, a phase beam splitter, a combination of two or more thereof, and a holographic beam splitter.

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